

8.0 IMPLEMENTATION AND COMPLIANCE 2016 ADDENDUM

The instrumentation and measurement methodology described in Section 8 of the April 2009 Petition reissuance demonstration document remains accurate, as does Table 8-1 (Utilities Outfall Daily RCRA Inspection Form) and Figure 8-1 (Deepwell Pre-treatment and Injection System). As such, Section 8 (Implementation and Compliance) has not been revised.

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8.0 IMPLEMENTATION AND COMPLIANCE

This section addresses how Ineos will comply with requested specific gravity/density and injection rate limitations requested in this Petition re-issuance demonstration.

8.1 Waste Stream Flow Diagram

Currently, WDW-163, WDW-164, and WDW-165 are utilized for the disposal of wastewater into three separate Injection Intervals. Figure 8-1 is a waste stream flow schematic which illustrates the waste stream flow from these three wells. During operation at the facility, process wastewater is filtered, pumped to the wellheads, and injected into the Ineos wells. Wastewater is collected in the process water clarifier tank and is then sampled downstream of the DE polishing filters from a sample port upstream of the injection pumps. The wastewater is then pumped to the three Ineos injection wells for subsurface disposal. A composite waste stream sample will continue to be collected from the composite waste flow line through the sampling port.

The waste stream grab sample is collected from the common flow line to the wells through the sampling port twice daily. This waste stream sample is sent to the on-site Ineos lab and the specific gravity is measured. The following section describes the measurement method.

8.2 Instrumentation and Measurement Methodology

Currently, two injection pumps deliver wastewater to the wellheads via pipelines, and the wastewater is then injected. Well operators sample the injection fluid downstream of the polishing filters (and upstream of the injection pumps) once each shift. The pH and specific gravity of this sample are measured and recorded every 12 hours (as per permit and Petition requirements) with a pH meter and hydrometer located in the utilities control room, after the fluid sample is cooled to 60 °F in a water bath (using ASTM D 1429-03, test method D). The currently used hydrometer measures specific gravity referenced to 60 °F, with a range of 1.00 to 1.07 at 60 °F. and graduations to 0.0005 units. A hydrometer

calibration certificate for the determination of the specific gravity of the waste stream is provided in Appendix H. This information includes recommended and facility equipment calibration schedules for the specific gravity. Ineos maintains all measurement documentation including instrument calibrations for verification of compliance within requested Petition values. If the hydrometer used to measure injectate specific gravity, with an upper limit of 1.07, indicates an injectate specific gravity reading higher than that calibrated maximum value, then a back-up hydrometer with a specific gravity maximum higher than 1.07 is used to measure the specific gravity. This back-up lab hydrometer is available to measure the injectate if the specific gravity exceeds 1.07 on the primary hydrometer. The calibration report for the back-up hydrometer is also included in Appendix H.

When collecting samples for specific gravity analysis, analysis are by gravimetric analysis. The fluid sample temperature is adjusted (if necessary) in a water bath to 60 °F (equivalent to 15.6 °C) and the specific gravity is recorded. The waste will remain within a daily average specific gravity range of 1.02 to 1.07 referenced to a 60 °F. Ineos operations personnel can quickly determine that the measured specific gravity is within the Petition-approved specific gravity range. As long as the hydrometer-derived daily average specific gravity or the running three-month average remains between these two values at this specific temperature, the waste for injection lies within the petitioned specific gravity range.

A sample document of the specific gravity measurement daily record keeping form used to record individual and daily average specific gravities is included as Table 8-1. Instrument precision information for the hydrometer used to record the daily specific gravity values is included in Appendix H. Ineos currently records the specific gravity (corrected to 60 °F using a hydrometer that references water at 60 °F) of the two daily grab samples of the injected waste stream, and uses continuous in-line recorders to capture injection stream volume and temperature data.

The algorithm for converting the grab sample-derived daily average specific gravity (sp. gr.) value to density (D) is $D = \text{sp. gr.} \times 0.999$ (density of fresh water at 60 °F), using a hydrometer referencing a water temperature of 60 °F. The level of accuracy of the hydrometer (generally three places to the right of the decimal point, depending on the hydrometer) and the small conversion factor value (0.999) result in the density of a sample (in g/cc) being essentially equal to the specific gravity of that sample at the same temperature, as Petition specific gravity and density values are only noted to two places to the right of the decimal point. The daily density variation of the composite waste stream typically is insignificant.

Alarms are provided in the plant control room to alert operators to high injection pressures, high flows, and high/low annulus pressures. A well is shut-in in the event that any operating parameters exceed the limits set forth in the injection well permit. Ineos will notify the TCEQ within 24 hours of any significant change in monitoring parameters or of any other observations which could reasonably be attributed to a leak or other failure of the injection well or Injection Zone integrity.

Ineos keeps complete and accurate records of all monitored parameters required by the permit or required as a condition of the petition for the injection wells. Ineos also keeps complete and accurate records of all periodic well tests, all shut-in periods and those times when emergency measures were used for handling injection fluid, and any additional information on conditions that might reasonably affect the operation of the injection wells.